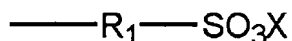


What is claimed is:

1. A composite electrolyte membrane comprising a modified silica in which silicon atoms have substituents as represented by formula 1 and formula 2; and an cation exchange group-containing polymer:

Formula 1



Formula 2



wherein, R<sub>1</sub> is an alkylene group with 2-7 carbon atoms, X is a hydrogen atom or an alkali metal, R<sub>2</sub> and R<sub>3</sub> are each independently an alkylene group with 2-7 carbon atoms.

2. The composite electrolyte membrane according to claim 1, wherein the content of the modified silica is 2 to 20% by weight.

3. The composite electrolyte membrane according to claim 1, wherein the grain size of the modified silica is 2 to 10 nm.

4. The composite electrolyte membrane according to claim 1, wherein the cation exchange group in the polymer is selected from a sulfonate group, a carboxyl group, a phosphate group, an imide group, a sulfonimide group, and a sulfonamide group.

5. The composite electrolyte membrane according to claim 1, wherein the cation exchange group-containing polymer is a highly fluorinated polymer which has a sulfonate group as an cation exchange group on one end of the side chain, and in which fluorine atoms amount to at least 90% of the total number of fluorine and hydrogen atoms bound to carbon atoms of the backbone and side chains of the polymer.

6. A fuel cell comprising:

a cathode for reducing an oxidizing agent;

an anode for oxidizing fuel; and

an electrolyte membrane being placed between the cathode and the anode,  
the electrolyte membrane being the composite electrolyte membrane according to  
5 any one of claims 1 to 5.